CLAIMS

WE CLAIM:

1. A liquid crystal (LC) optical performance monitor (OPM), comprising:

a C-polarizer having a birefringent crystal having a first face and a second face for receiving a collimated beam and separating the collimated beam into a P-polarization beam and a S-polarization beam;

a waveplate coupled to the second face of the crystal for rotating the S-polarization beam by 90 degrees, thereby causing the rotated S-polarization beam to have the same polarization as the P-polarization beam; and

a liquid crystal tunable filter for receiving and processing the P-polarization beam and the rotated S-polarization beam from the C-polarizer.

2. The LC OPM of Claim 1, further comprising a small beam collimator coupled to the first face of the C-polarizer, the small beam collimator receiving an input beam and collimating the input beam to become the collimated beam.

3. The LC OPM of Claim 1, further comprising a beam collimator coupled to the first face of the C-polarizer, the beam collimator providing a minimal space separation between the P-polarization beam and the rotated S-polarization beam.

4. The LC OPM of Claim 2, wherein C-polarizer and the small beam collimator are rotated to match a polarization orientation of the LC material inside a LC cavity of the LC tunable filter.

5. The LC OPM of Claim 4, further comprising a photodiode for receiving the P-polarization beam and rotated S-polarization beam.

6. The LC OPM of Claim 1, further comprising a bi-cell photodiode having a first cell and a second cell, the first cell of the bi-cell photodiode receiving the P-polarization beam, the second cell of the bi-cell photodiode receiving the rotated S-polarization beam.

7. A method of a LC OPM, comprising:

separating a collimated beam into a P-polarization beam and a S-polarization beam;

rotating the S-polarization beam by 90 degrees, thereby the S-polarization beam having the same polarization as the P-polarization beam; and

scanning to filter the spectral information of the S-polarization beam and the P-polarization beam by a liquid crystal tunable filter.

8. The method of Claim 8, further comprising collimating an input beam to generate the collimated beam.

9. The method of Claim 10, further comprising matching the alignment of the LC filter in the direction of the liquid crystal.

10. The method of Claim 10, further comprising applying a voltage to an LC tunable filter to affect the rotated S-polarization beam and the P-polarization beam.

11. A method of a LC OPM, comprising:

separating a collimated beam into a first beam comprising a first linear polarization and a second beam comprising a second linear polarization that is orthogonal to the first linear polarization;

rotating the polarization of one of the first beam or the second beam by 90 degrees, thereby causing the first and second beams to have the same polarization; and

scanning to filter the spectral information of the first beam and the second beam by a liquid crystal tunable filter.

12. The method of Claim 11, further comprising collimating an input beam to generate the collimated beam.

13. The method of Claim 12, further comprising matching the alignment of the LC filter in the direction of the liquid crystal.

14. The method of Claim 13, further comprising applying a voltage to an LC tunable filter to affect the rotated first beam and the second beam.